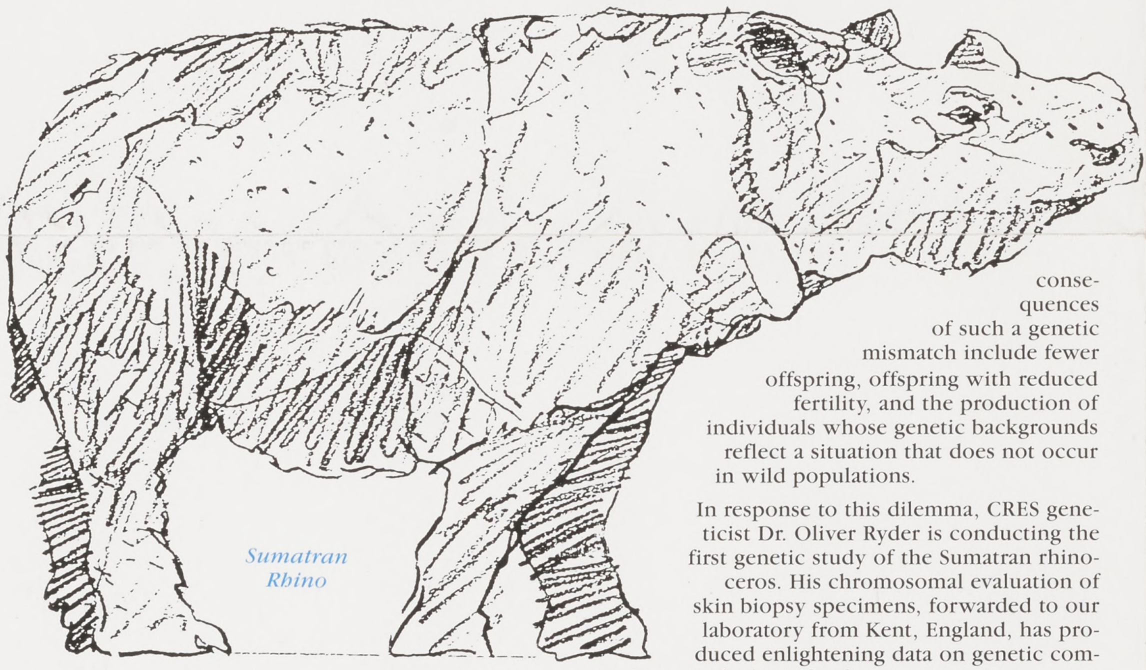
THE CENTER FOR REPRODUCTION OF ENDANGERED SPECIES
CRES Report

WINTER 1988

The Center for Reproduction of Endangered Species would like to welcome new readers of CRES Report.

REPRODUCTIVE PHYSIOLOGY

In captive breeding situations, it is often necessary to assess a female's estrus status accurately and rapidly for timed matings or artificial insemination. Through vaginal cytology techniques, cells can be collected, stained and examined under a microscope within one hour. The size, shape and color of the stained cells reflect the current hormonal status of the female, enabling a scientist to determine the stage of an animal's estrus cycle.



Sumatran Rhino

The collection of these cells (swabbing) is simple and non-stressful for the animal. However, for routine collection there is one prerequisite — a cooperative female. One such female is "Asia", the clouded leopard seen in the Zoo's Chit-Chat educational show. Under the direction of Dr. Barbara Durrant, twice weekly vaginal swabs were analyzed by technician Joan Yamada over an 18 month period. Physiological information resulted that had never before been reported for the clouded leopard: age at first estrus, estrus cycle length, duration and frequency of mating during estrus and timing of postpartum estrus.

We are hopeful that similar evaluations of cheetahs, Asian elephants and koalas will bring to light equally valuable data to aid in successful reproduction.

AVIAN ENDOCRINOLOGY

CRES is presently participating in a joint project with Sea World Inc. to measure fertility in Emperor penguins. While not endangered, the Emperor species has not been reproducing in captivity as successfully as in the wild. According to Dr. Arden Bercovitz, Sea World will be using data from the endocrine studies to make decisions about ways to enhance reproduction among these spectacular birds.

GENETICS

Rhinoceroses have roamed the earth for about 50 million years. Where more than 150 species have flourished, today there are only five. These are all endangered — threatened with extinction by poaching and deforestation. During the 1970's alone, more than half the world's rhinoceros population was destroyed in this manner.

Efforts are now underway to establish captive populations of Sumatran rhinos. Ten of the animals found in Borneo, Sumatra, Malaysia and the Asian mainland were rescued from forest habitats scheduled to be cleared for farming. Awaiting placement in breeding groups, the rhinos are now in captivity in Southeast Asia and Great Britain.

Unless it can be determined whether Sumatran rhinos from different geographic backgrounds are genetically compatible, we run the risk of establishing inappropriate breeding pairs. The potential consequences of such a genetic mismatch include fewer offspring, offspring with reduced fertility, and the production of individuals whose genetic backgrounds reflect a situation that does not occur in wild populations.

In response to this dilemma, CRES geneticist Dr. Oliver Ryder is conducting the first genetic study of the Sumatran rhinoceros. His chromosomal evaluation of skin biopsy specimens, forwarded to our laboratory from Kent, England, has produced enlightening data on genetic composition, and a basis for future comparison.

Dr. Ryder anticipates that additional samples will be collected during the process of transporting the rhinos to form breeding groups. Samples collected by individuals with the AAZPA Sumatran Rhino Trust will be forwarded to San Diego for analysis. Says Dr. Ryder, "Additional genetic studies are clearly necessary if we are to preserve the genetic integrity of this species."

INFECTIOUS DISEASES

Captive-raised cheetahs are particularly susceptible to a coronavirus disease known as feline infectious peritonitis, or FIP. This deadly virus is extremely unusual in that it induces antibodies to aggravate the disease rather than resist it. At CRES, virologist Dr. Michael Worley continues to make progress in combating this puzzling disease.

Dr. Worley's research group has produced a library of monoclonal antibodies to use in probing the protective portion of the FIP virus, and to aid in identifying the parts of the virus that are beneficial to an exposed animal. By understanding the structure of coronaviruses we hope to determine the potential for a vaccine.

Black and White Ruffed Lemur

PATHOLOGY

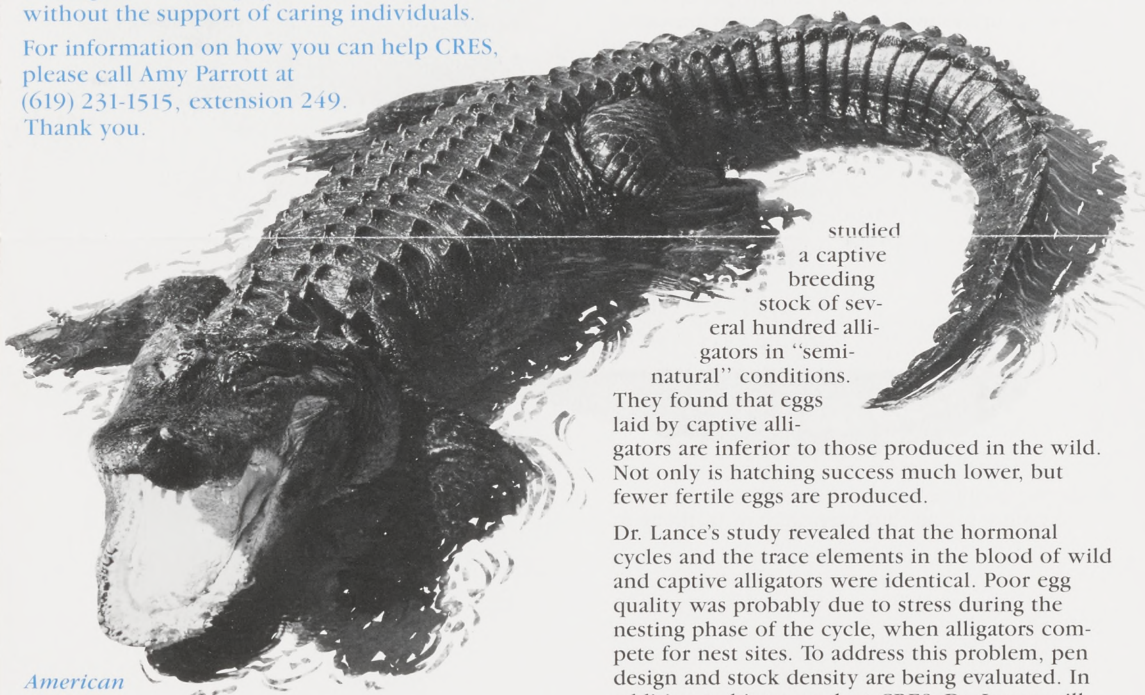
Rapidly shrinking habitat on their native island of Madagascar has caused every species of lemur to be placed on the endangered species list. Yet lemurs in captivity are equally at risk, due to a progressive condition known as Hemosiderosis. This disease, rampant among captive lemurs, results when excessive amounts of iron accumulate in the cells of the liver and lining of the small intestine.

Wild lemurs are apparently free of this abnormality. Why the difference in iron metabolism occurs was the topic of a student fellowship study under the direction of CRES pathologist Dr. Marilyn Anderson, funded by the San Diego County Heart Association.

The investigation found that wild lemur diets are high in tannins, a family of compounds that bind iron in the intestinal tract, reducing iron absorption. The addition of tannins to captive lemur diets may help to prevent excessive iron build-up in tissues. Further research is being conducted to formulate a diet that will control this potentially fatal imbalance.

Led by Dr. Werner Heuschele, CRES scientists are making significant advances in wildlife research. But their goal of replenishing endangered animal populations cannot be met without the support of caring individuals.

For information on how you can help CRES, please call Amy Parrott at (619) 231-1515, extension 249. Thank you.



American Alligator

BEHAVIOR

Socially isolated for more than eight years, five Crab-eating macaques are gradually being reintroduced to one another with the application of CRES resocialization techniques. Chester, Hayden, Adidas, Sisyphus and Montaign were seized from a controversial research project in Silver Springs, Md. and placed here for social rehabilitation by the National Institutes of Health.

CRES behaviorist Dr. Donald Lindburg will oversee the two-year process, which is based on knowledge he acquired by working with macaques in field and laboratory settings. The entire project is being financed by concerned universities and biomedical firms.

According to Dr. Lindburg, the monkeys may have to relearn the complexities of a social environment. Since macaques are by nature aggressive toward strangers, they could physically harm one another unless care is taken to introduce them very gradually. "Each has already undergone a preliminary assessment of temperament and locomotor skills — factors that will play a major role in successful integration. By placing other macaques in a cage nearby, we can also monitor displays of dominance or submissiveness."

Dr. Lindburg feels the macaque resocialization project is not only a humane effort, but a valuable experience that will benefit behavior research. "We stand to learn from this experience lessons that will apply to our primary responsibility, the conservation of endangered species."

ENDOCRINOLOGY

We would like to extend a warm welcome to Dr. Valentine Lance, who joined CRES in September as head of the Endocrinology Division. Dr. Lance was previously an assistant professor at Tulane University School of Medicine in New Orleans.

The American alligator is the subject of an extensive investigation conducted by Dr. Lance in collaboration with the Louisiana Department of Wildlife and Fisheries. Once considered close to extinction, the American alligator has re-established itself along the coastal wetlands of the Southeastern United States. But as their marshland habitat continues to disappear at an alarming rate, the future of the American alligator is uncertain.

In an effort to reproduce the species more successfully in captivity, Louisiana wildlife biologists studied a captive breeding stock of several hundred alligators in "semi-natural" conditions. They found that eggs laid by captive alligators are inferior to those produced in the wild. Not only is hatching success much lower, but fewer fertile eggs are produced.

Dr. Lance's study revealed that the hormonal cycles and the trace elements in the blood of wild and captive alligators were identical. Poor egg quality was probably due to stress during the nesting phase of the cycle, when alligators compete for nest sites. To address this problem, pen design and stock density are being evaluated. In addition to his research at CRES, Dr. Lance will continue to study alligator reproduction.

CRES
THE CENTER FOR REPRODUCTION OF ENDANGERED SPECIES
Development Department
Zoological Society of San Diego
Post Office Box 551
San Diego, California 92112-0551

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SAN DIEGO, CALIF.
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The Center for Reproduction of Endangered Species (CRES) is operated by the Zoological Society of San Diego, a non-profit organization.

CRES Report is designed by Stephanie Moore.